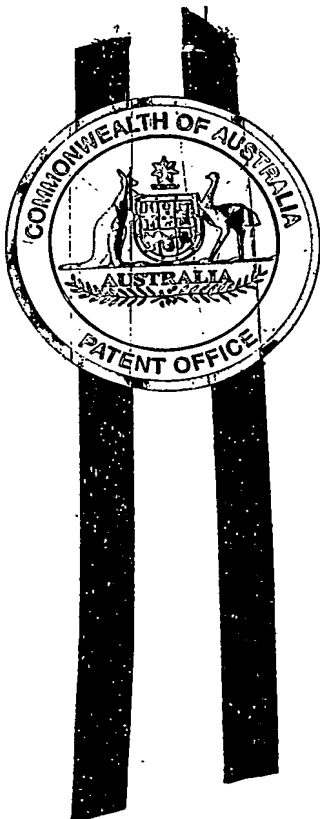




PCT/AU2004/001390

**Patent Office  
Canberra**

I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004902069 for a patent by BREVILLE PTY LIMITED as filed on 19 April 2004.



WITNESS my hand this  
Twenty-ninth day of October 2004

A handwritten signature in black ink, appearing to be 'AA' or a stylized 'L'.

LEANNE MYNOTT  
MANAGER EXAMINATION SUPPORT  
AND SALES

P00009  
Regulation 3.2

AUSTRALIA

Patents Act 1990

**PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:**

**IMPROVED CITRUS JUICER**

**This invention is described in the following statement:-**

## **Improved Citrus Juicer**

### **Field of the Invention**

The invention pertains to citrus juicers and more particularly to  
5 improvements in reamer design.

### **Background of the Invention**

The applicant's pending provisional Patent Application No. 2003905812  
is incorporated herein by reference. Reamer design is important to the ease  
10 of use, efficiency and versatility of a citrus juicer. The reamer is intended to  
penetrate a half of a citrus fruit. Pressure between the fruit and reamer and  
relative rotation between the two results in the separation of the juice from the  
fruit. The exterior surface of the reamer normally carries ribs for the purpose  
of rupturing the juice sacks with are characteristic in citrus fruit.

15 Some juicers utilize the interior of a second dome as a means of  
conveniently applying pressure to the exterior of the citrus fruit being juiced.  
Other juicers rely on hand pressure. In any event, a single prior art reamer  
has generally not been well adapted to the job of extracting juice from a wide  
variety of citrus fruit types. Reamers which are suitable for lemons and limes  
20 are rarely, if ever, suitable for larger oranges and grapefruits. Thus, prior art  
citrus presses are known to have interchangeable reamers.

### **Objects and Summary of the Invention**

It is an object of the invention to provide a reamer for a citrus press that  
25 is efficient and versatile.

It is also an object of the invention to provide a citrus reamer which is  
useful in motorized juicers, non-motorized juicers, juicers having fruit domes  
and juicers which utilize only the hand to apply the citrus fruit to the reamer.

It is also an object of the invention to provide a fruit dome which is  
30 adapted to co-operate with the reamer of the present invention.

Accordingly, there is provided a reamer for a citrus press. The exterior  
surface of the reamer features a plurality of primary ribs. The primary ribs  
extend from an upper portion of the reamer to a lower edge of the reamer.  
The ribs have a compound profile.

A reamer profile is defined by tips of the ribs. The profile can be seen as having two distinct sections. A lower portion of the profile defines a section having a smaller longitudinal radius. An upper portion of the reamer defines a section with a larger longitudinal radius, or optionally, flat or nearly flat sides.

5 In other embodiments of the invention, a fruit dome is provided. The fruit dome has internal arresting ribs and each internal rib has a profile which co-operates with the profiles of the primary ribs on the reamer.

In other embodiments of the invention an upper extent of each primary rib further incorporates one or more retaining spikes surrounding a pin.

10 In yet other embodiments of the invention, the reamer incorporates, along a lower margin, pulp stirring paddles.

#### Brief Description of the Drawing Figures

15 Figure 1 is a perspective drawing of a citrus press which incorporates a reamer, a lever and a fruit dome;

Figure 2 is a cross-section view of a fruit press illustrating the co-operation between a reamer and fruit dome;

Figure 3 is a perspective view of a fruit press which does not use a lever or fruit dome;

20 Figure 4 is a side elevation of a reamer in accordance with the teachings of the present invention;

Figure 5 is a perspective view of the reamer depicted in Figure 4;

Figure 6 is a top plan view of the reamer depicted in Figure 5;

Figure 7 is a cross-section through the reamer depicted in Figure 4;

25 Figure 8 is a cross-section of a fruit dome;

Figure 9 is an inverted perspective view of the fruit dome depicted in Figure 8;

Figure 10 is a side elevation of a fruit dome of the type depicted in Figures 8 and 9;

30 Figure 11 is a cross-section of the fruit dome depicted in figure 10, through lines B-B;

Figures 12(a) and 12(b) depict a grapefruit utilized with the reamer and dome of the present invention;

Figures 13(a) and 13(b) are cross-sections depicting an orange being juiced with the reamer and dome of the present invention;

Figures 14(a) and 14(b) are cross-sections depicting a lemon being juiced with the reamer and dome of the present invention;

5      Figures 15(a) and 15(b) are cross-sections depicting a lime being juiced with the reamer and dome of the present invention; and

Figures 16(a) and 16(b) are side and perspective views of a reamer with no spikes or pin.

10


#### Best Mode and Other Embodiments of the Invention

As shown in Figure 1, a citrus press or citrus juicer 10 comprises an optionally motorized base 11 which drives a removable, rotating reamer 12. In this example, a removable fruit strainer 13 is used to separate citrus juice from seeds and excessive pulp. Juice passing through the strainer 13 exits the device through a spout 14 and is collected for consumption. The interchangeability of the strainer 13 allows a user to select from a plurality of strainers 13, each with different sized filter openings.

15      In the example of Figures 1 and 2, the reamer 12 works in co-operation with a fruit dome 15. The fruit dome does not rotate. The fruit dome 15 may be carried by a handle 16 which is hinged to the base 11 as described in the applicant's above referenced co-pending provisional application. The dome 15 may be removable from the handle 16, as required. In operation, a citrus fruit half 17 is first placed onto the reamer 12 and stabilised by pressing it into place. Next, the dome 15 is lowered by use of the handle 16. When the fruit half is mostly within the dome and sufficient pressure is delivered by the dome 15, the motor engages and rotates the reamer 12. Handle pressure is maintained until the juicing operation is completed.

20      As shown in Figure 3, a citrus press 10 according to the invention need not utilize a dome 15 or handle 16, in fact, it need not include a motor or motorized base in the sense that the features which will be described in reference to the reamer are equally applicable to all varieties to citrus juice extraction devices.

30



As shown in Figures 4-7 a reamer 12 is seen as having a longitudinal axis 40 of rotation. The reamer 12 has a domed exterior surface 41 and primary juicing ribs 42. The exterior surface may incorporate secondary ribs 43 located between the primary ribs 42. In this example, the primary ribs 42 are four in number and extend above the main surface 41 from the centre 43 of the reamer all the way down to the lower edge 44. Each primary rib preferably incorporates an elevated projection 45 or spike which serves to stabilize the fruit during juicing operations. The lower part 46 of the reamer operates primarily on larger fruits such as oranges and grapefruits. We can define a longitudinal radius 47 as a radius of a circle that is in the same plane as the longitudinal axis 40 and which therefore sweeps out a profile in the same plane as the longitudinal axis 40.

The lower portions of the ribs 42 have a longitudinal radius 47 which is more or less the same radius as a large orange or grapefruit.

An upper portion of the primary ribs 48 will also make contact with large fruit but must also allow for the efficient juicing of limes, small oranges and lemons. In this example, the longitudinal radius 49 is greater than the longitudinal radius 47. The origin of the longitudinal radius 49 is farther from the axis 40 than the longitudinal radius 47 is from the axis 40. This causes the upper section 48 to sweep out a volume which approximates a cone, notwithstanding the pin 53 and spikes 45.

The reamer also incorporates a transitional section 50 located between the upper portion 48 and the lower portion 46. This allows longer fruit to slide down the rib tips smoothly when pressed onto the reamer.

As shown in Figure 5, the reamer 12 may incorporate convex paddles 52. In this example, the paddles extend away from the lower rim 44 and are primarily used to sweep the strainer 13 free from extraneous pulp so that juice can flow more efficiently toward to spout 14. This figure also illustrates that the reamer has a central pin 53. The purpose of the pin 53 is two fold. First, it is adapted to pierce the flesh of a citrus fruit and thereby stabilize the fruit when the dome is lowered. Second, it provides a limitation to the advance of the dome so that the interior of the dome and exterior of the reamer do not make contact.

It should be considered that the pin 53 and spikes 45 are primarily used in conjunction with a motorized reamer with fruit dome. A manual version would omit these features and take on the appearance given by Figure 16. Note that the longitudinal radius 162 of the upper section 163 approximates  
5 the radius of a small lime.

As shown in Figures 6 and 7, the primary ribs 42 are tapered from root to tip and extend above the main exterior surface of the reamer. Each rib 42 has a radiused tip 60 which is intended to create relatively high surface pressures with the citrus fruit but not be so sharp as to be destructive to the  
10 fruit nor present a risk of injury. The intermediate or secondary ribs 43 subdivide the exterior surface of the reamer into concave scalloped areas 70. The secondary ribs 43 play some part in the juicing operation and also help to maintain low friction between the reamer and the fruit.

A fruit dome according to the teachings of the present invention is  
15 illustrated in Figures 8-11. As shown in Figure 8, the interior 81 of the dome 15 is characterized by internal and inward facing ribs 82. Note that each rib 82 presents a flat face 83 and an angled face 84. In this example, the reamer rotates in the direction of the arrow 85 so that the twisting motion of the citrus fruit half is resisted by the flat face 83 of each rib 82.

As shown in Figure 9, the ribs 82 are generally straight and extend  
20 from the central portion 90 of the dome 15 toward the lower edge 91. The central portion 90 includes a cup like depression which is adapted to make contact with the pin 53 on the reamer. In this example, the ribs are generally straight but they may also include a slight twist or spiral path that drives the  
25 fruit half toward the central portion 90. As shown in Figure 11, each rib 82 has a profile 110 which closely resembles the external profile of the ribs on the reamer. It is advantageous that the upper portion 111 have a conical shape with relatively flat sides (or large longitudinal radius) and sharp apex angle 112.

As shown in Figure 12(a), a grapefruit 120 is loaded onto the reamer  
30 pin 53 and subsequently lowered into position over the rotating reamer 12 by pressure applied onto the dome 15. As shown in Figure 12(b) the combination of reamer 12 and dome 15 are able to efficiently juice the large diameter grapefruit because the grapefruit find is able to conform to the

external compound curvature shape of the reamer 12 without splitting. Note that the rind 121 essentially flexes in the area of the intermediate portion.

Figure 13 illustrates the same principles applied to an orange. The size of the orange is such that it conforms to the upper portion of the reamer 48,  
5 accommodates the transition portion 50 and extends only slightly into the larger diameter lower portion 46.

The juicing of a lemon is depicted in Figures 14(a) and 14(b). The nearly conical shapes of the upper portions of the reamer and dome are preferably optimized for and instrumental in ensuring that the lemon is  
10 stationery when the reamer turns and that the rind of the lemon does not tear during juicing. The configuration of the ribs on the reamer and dome also work in conjunction with the reamer profile to accommodate a wide range of citrus fruit for juicing.

As shown in Figures 15(a) and 15(b) the upper portion 48 of the reamer  
15 is ideal for juicing small fruit such as limes. The lime conforms easily to the upper portion 48 and hardly reaches the transitional portion 50.

As shown in Figure 16, a reamer 160 for use without a fruit dome does not need the spikes or pin. In this example, the primary ribs 161 join together in the centre of the reamer. The longitudinal radius 162 in the area of the  
20 centre approximates the radius of a small lime.

While the invention has been disclosed with reference to particular details of construction, these should be understood as having been provided by way of example and not as limitations to the scope or spirit of the invention as disclosed herein.

25



Fig. 1

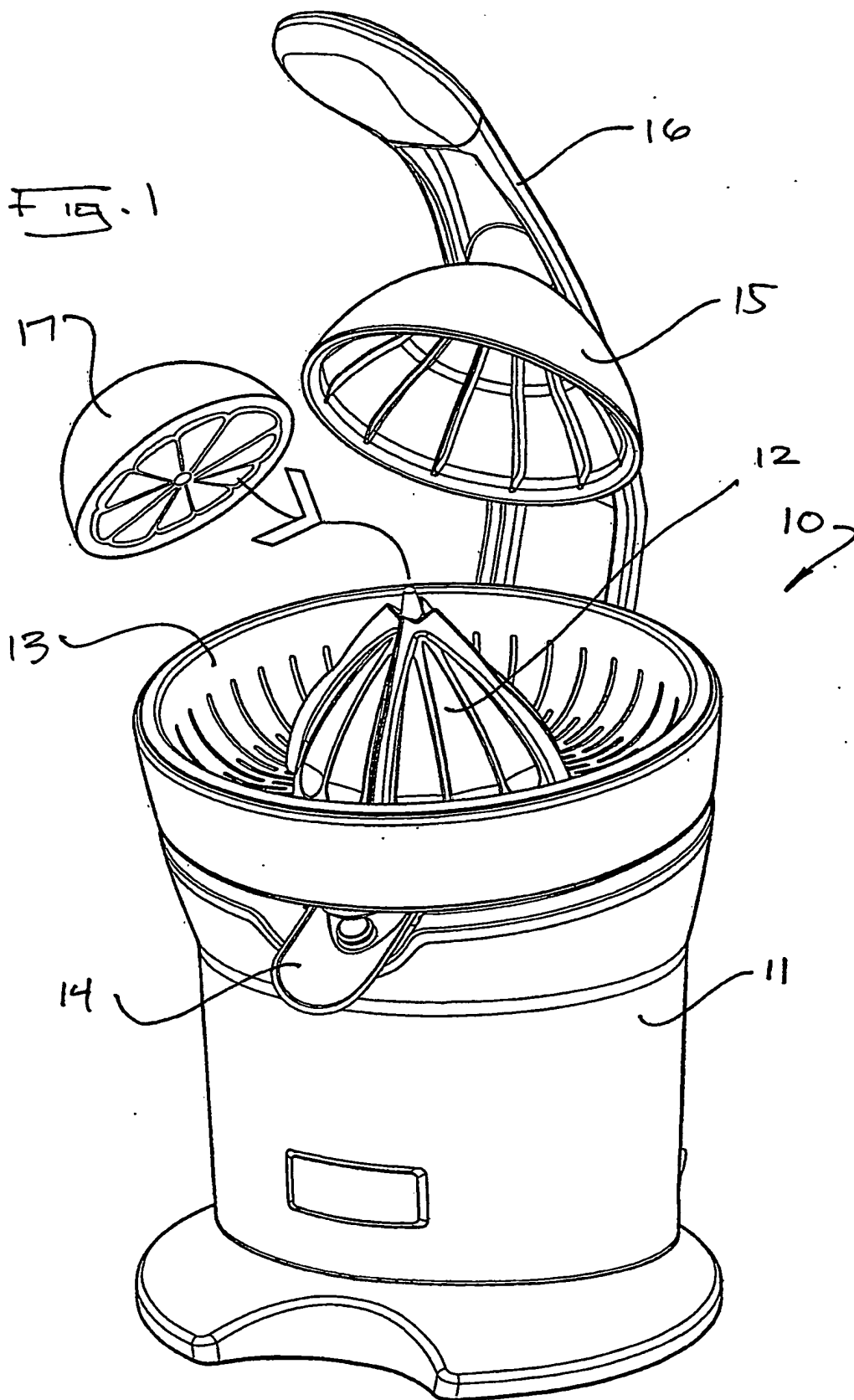
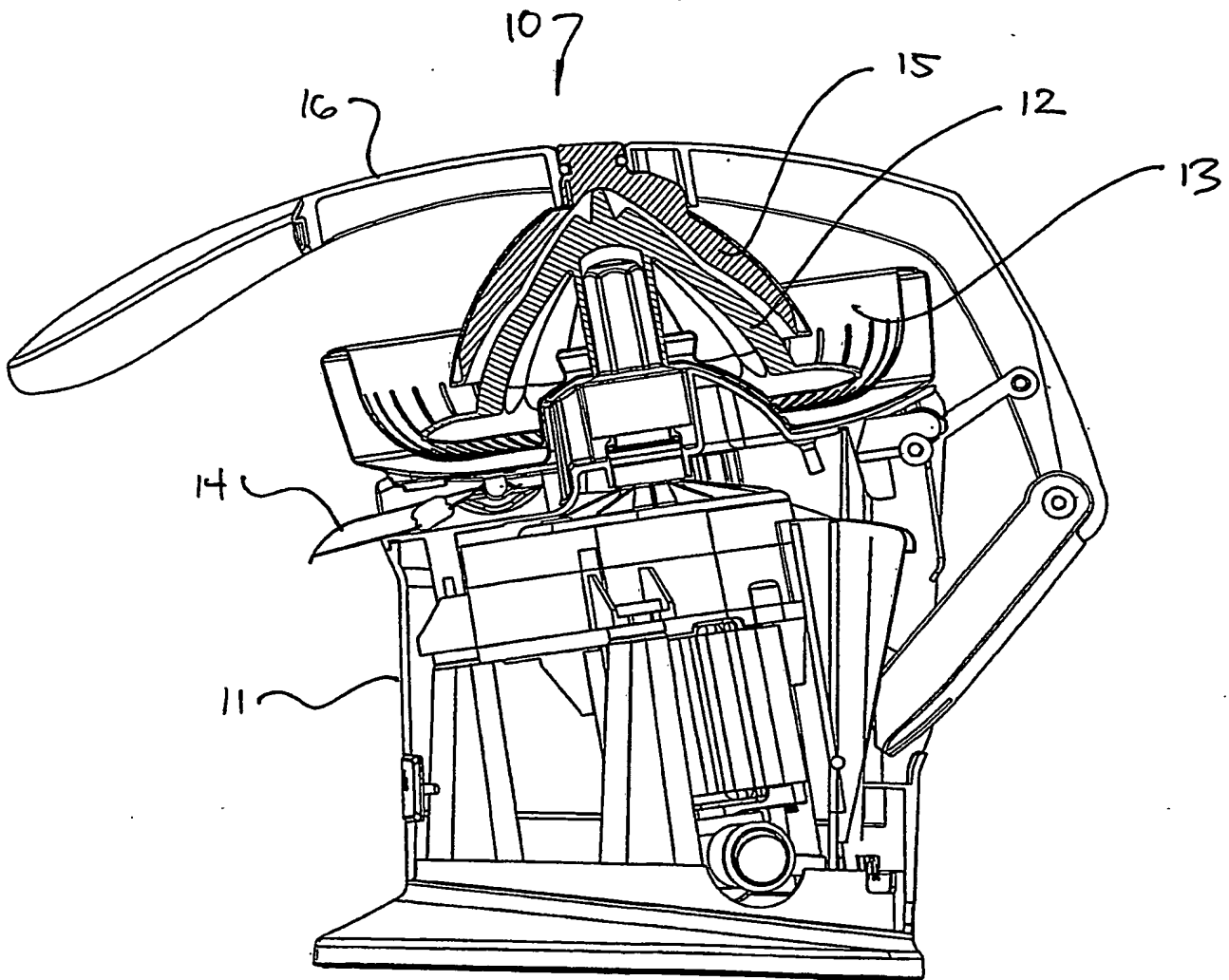
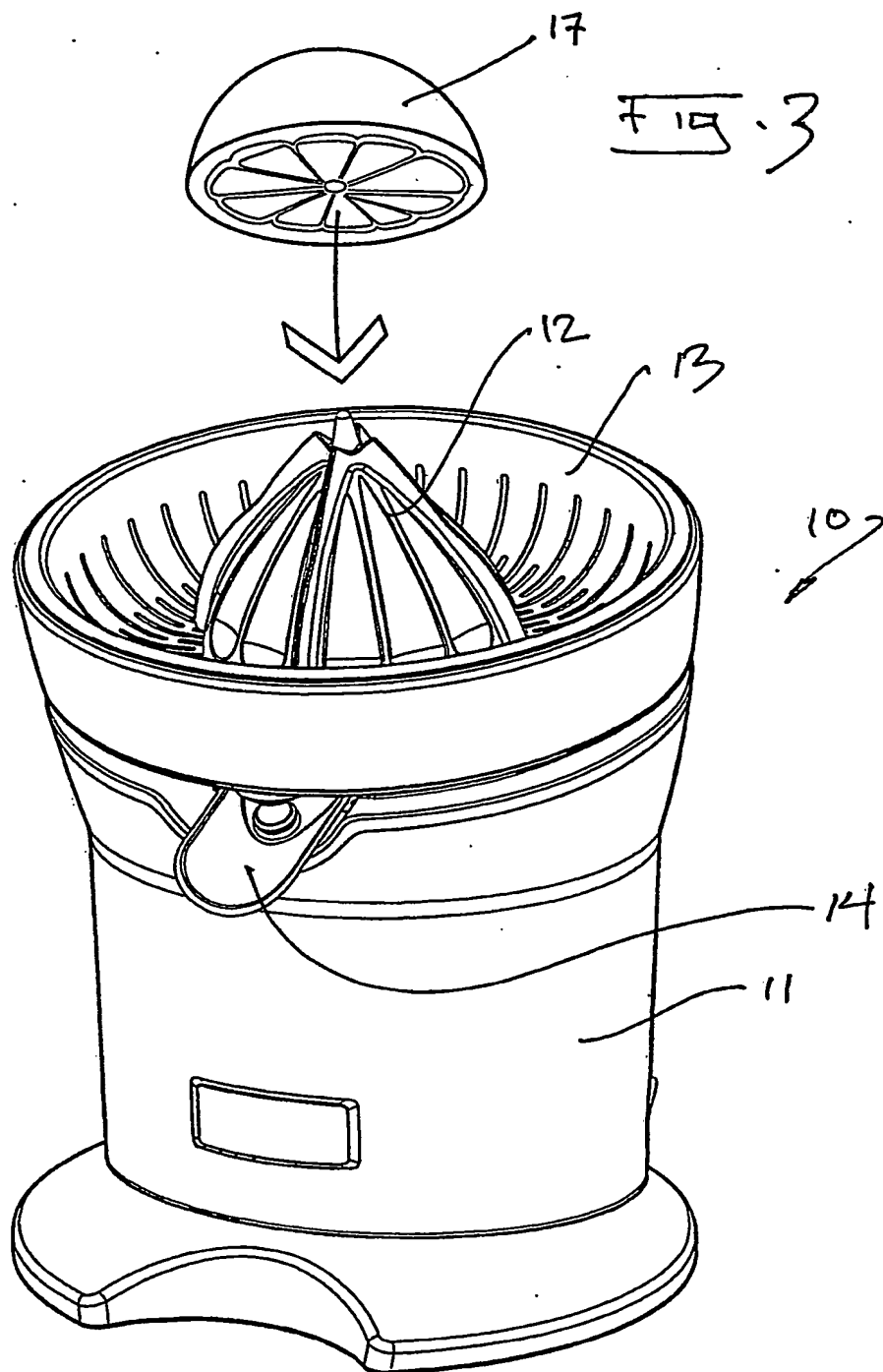
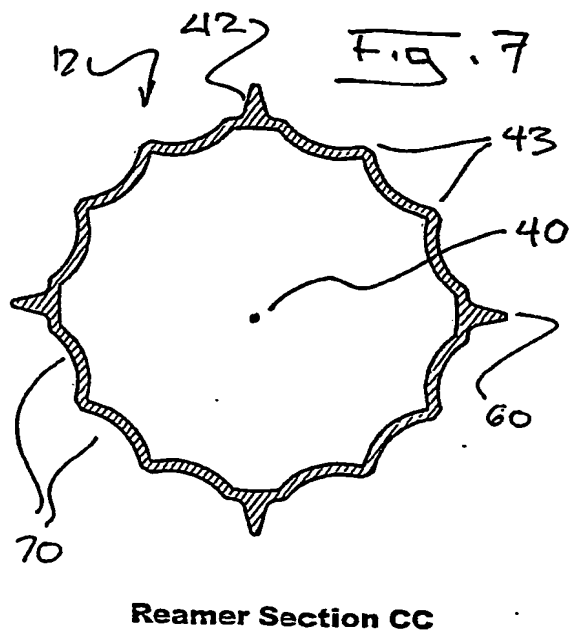
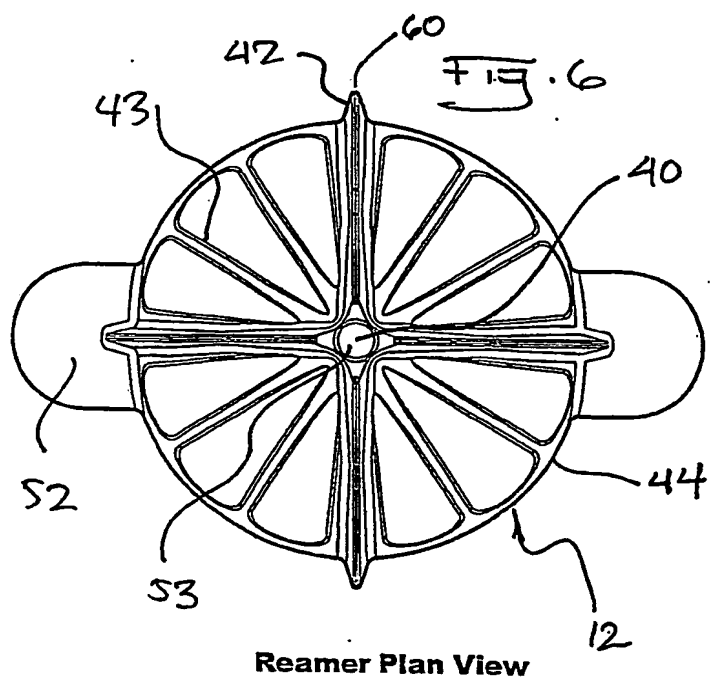
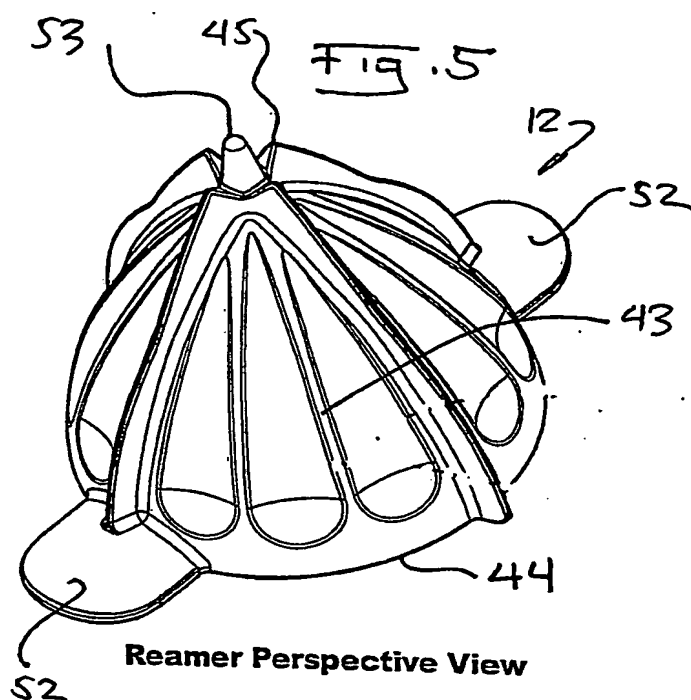
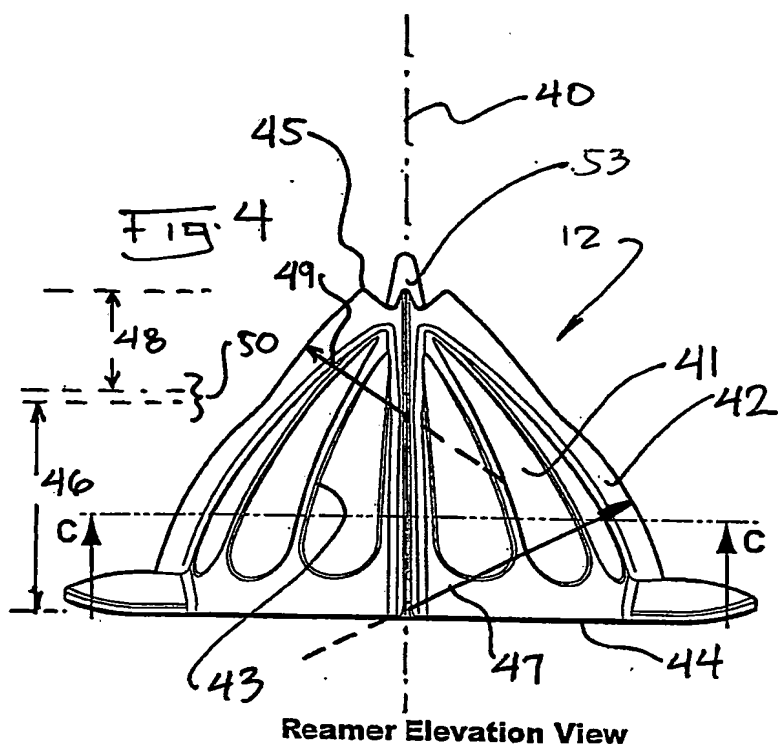
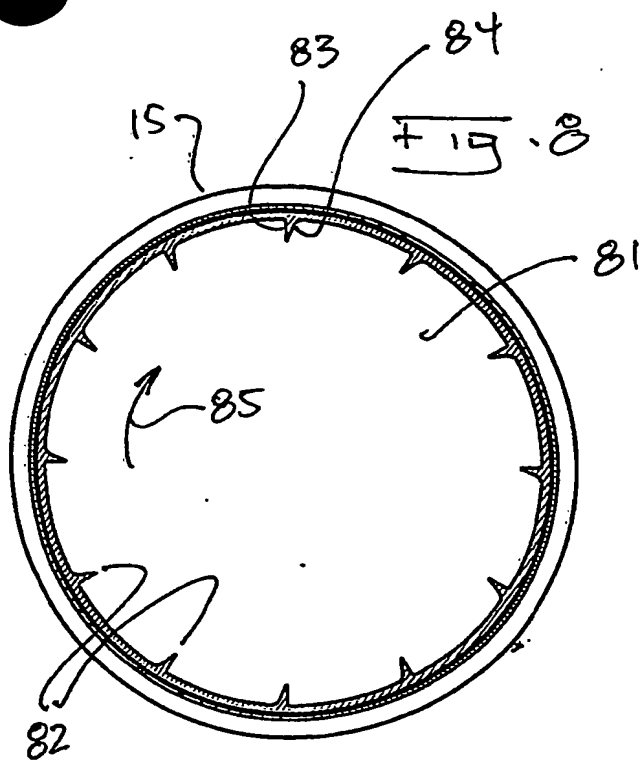


FIG. 2

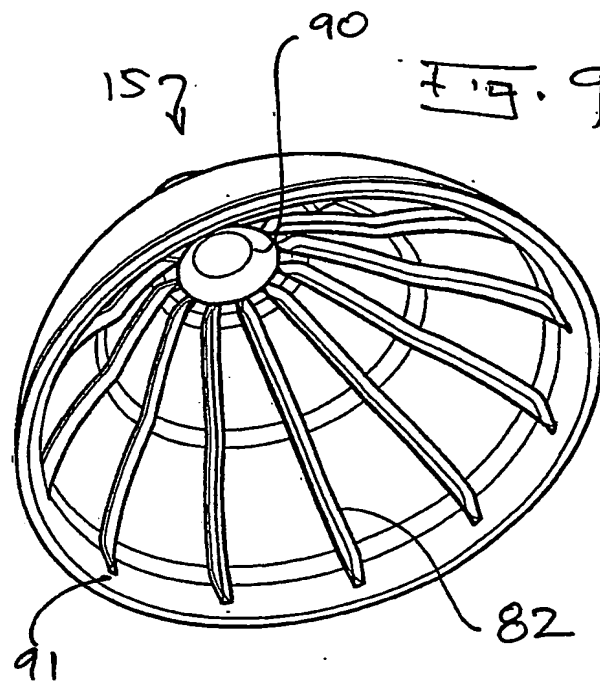




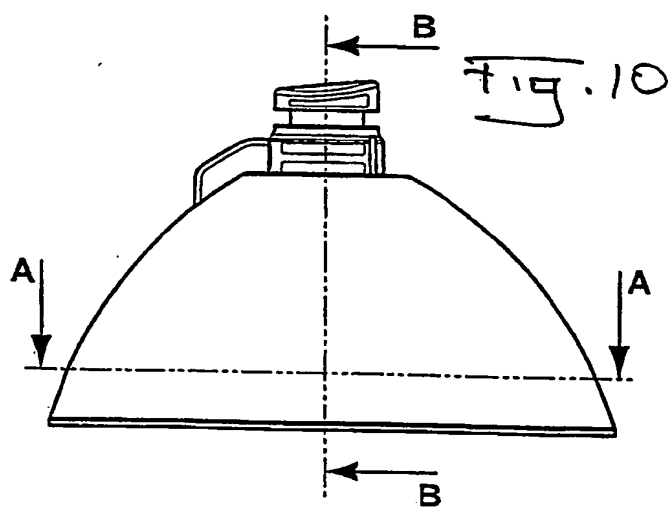




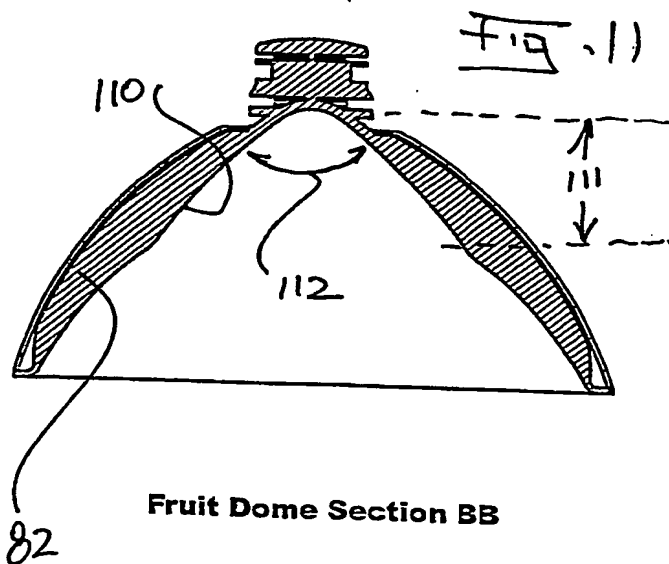
Fruit Dome Section AA



Fruit Dome Perspective View



Fruit Dome Elevation



Fruit Dome Section BB

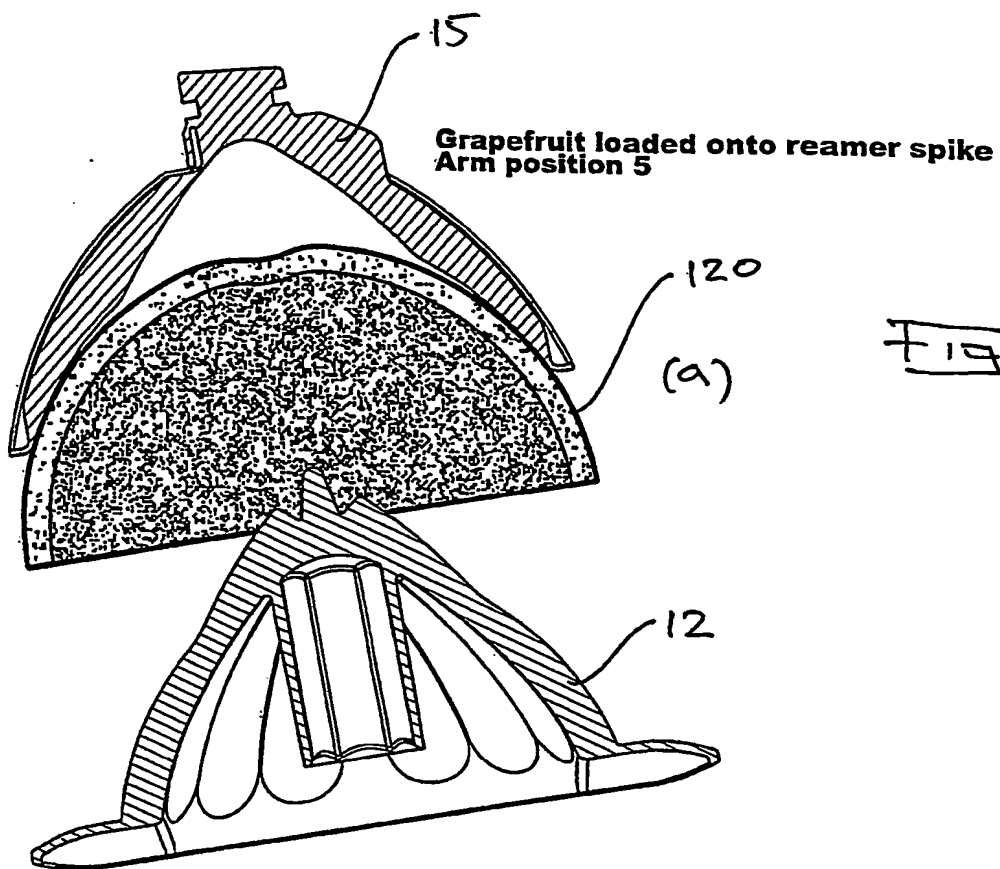
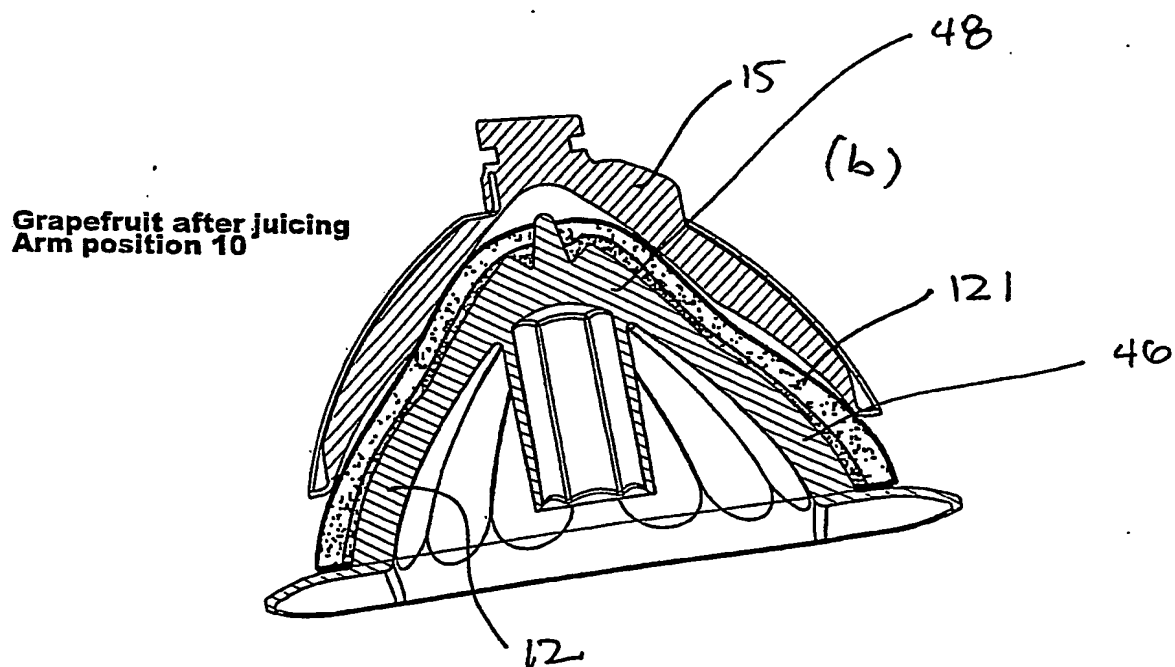
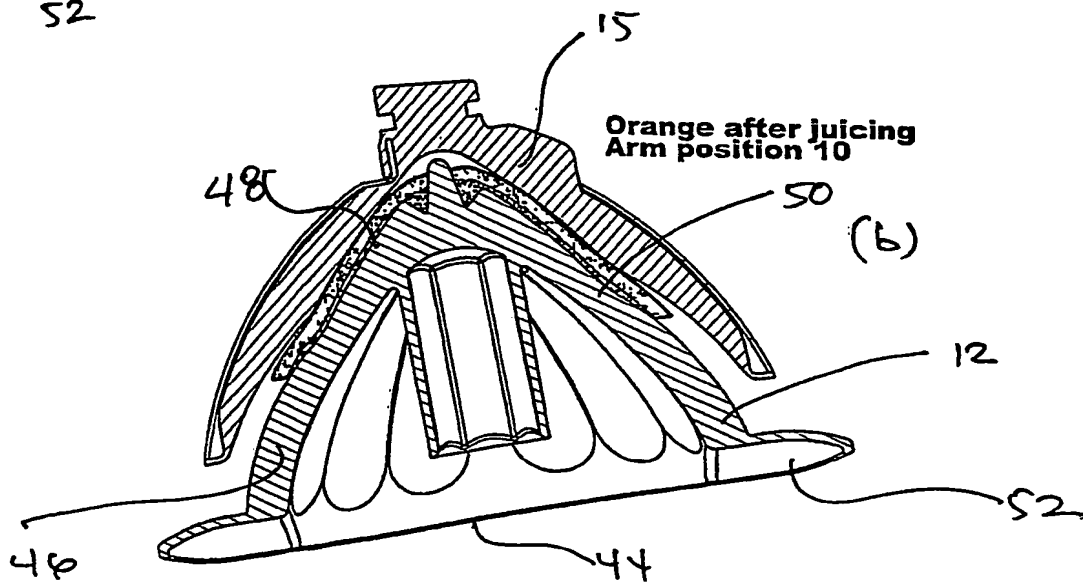
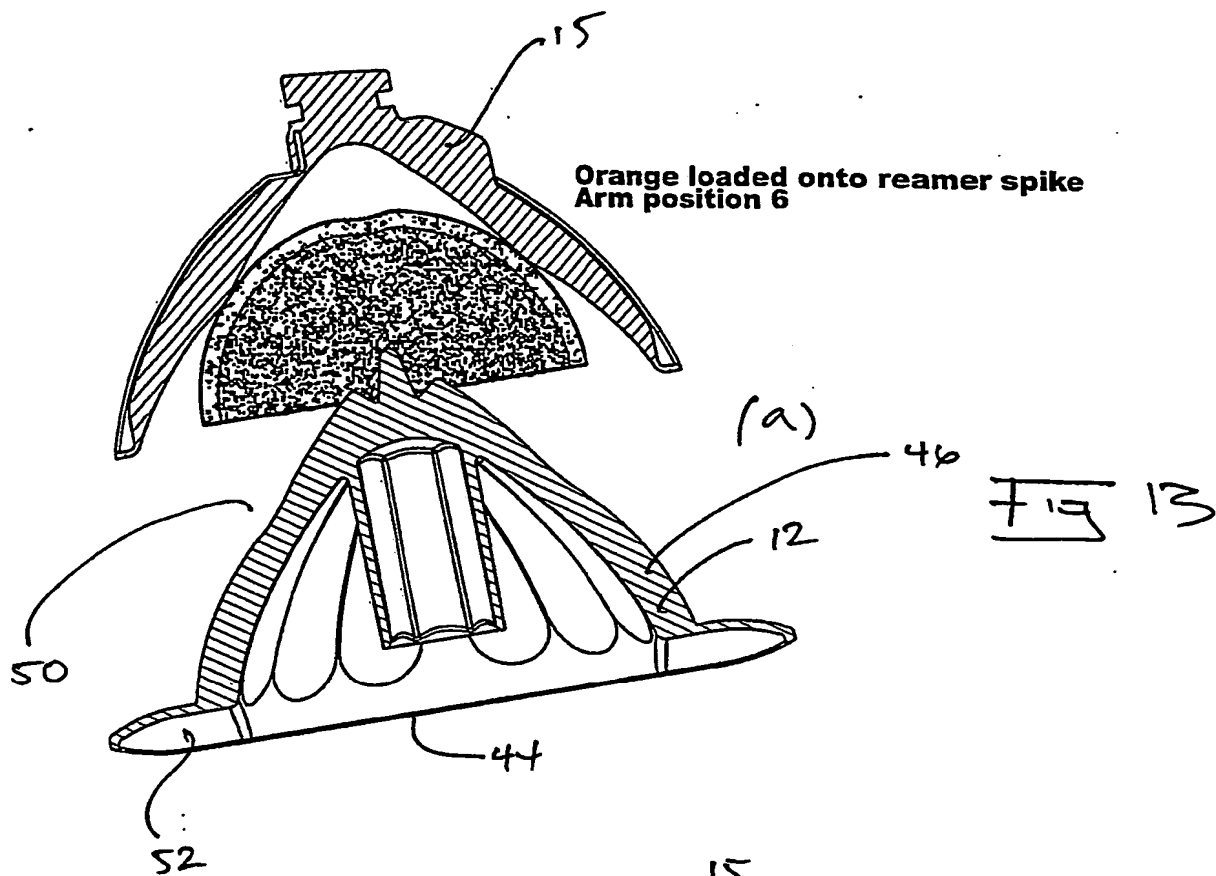
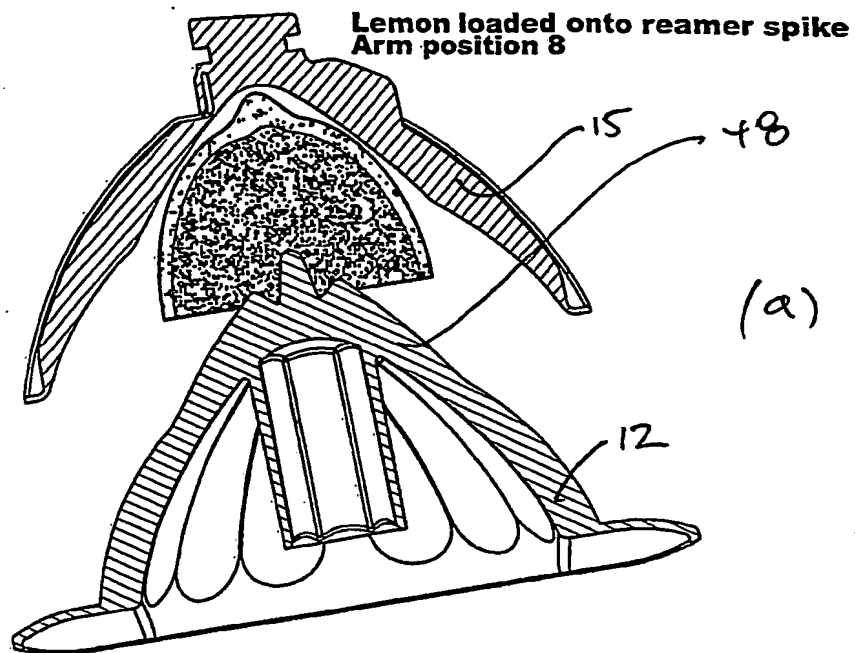


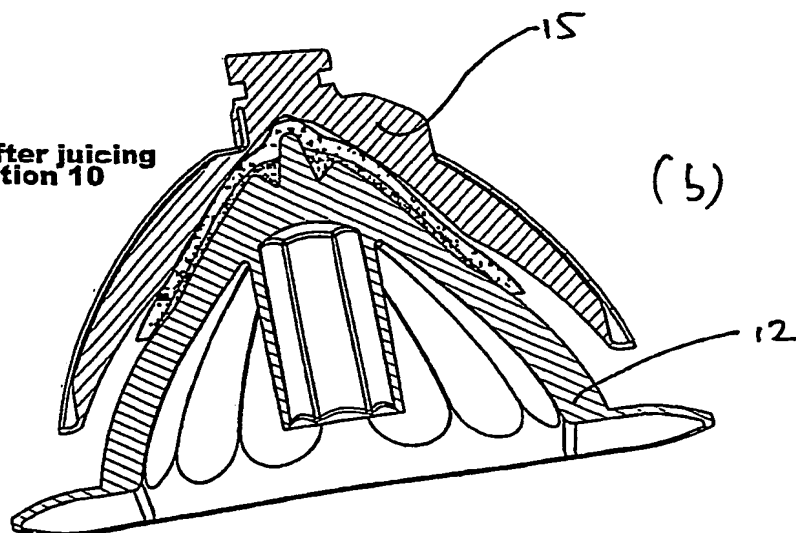
FIG. 12



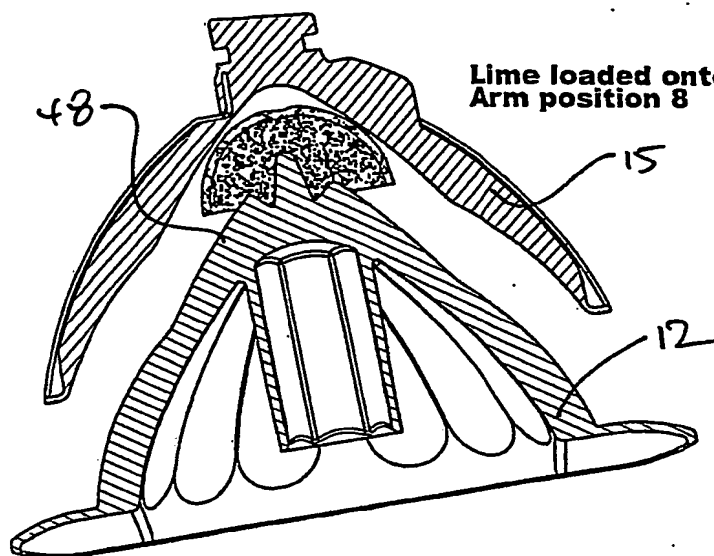




**Lemon after juicing**  
**Arm position 10**



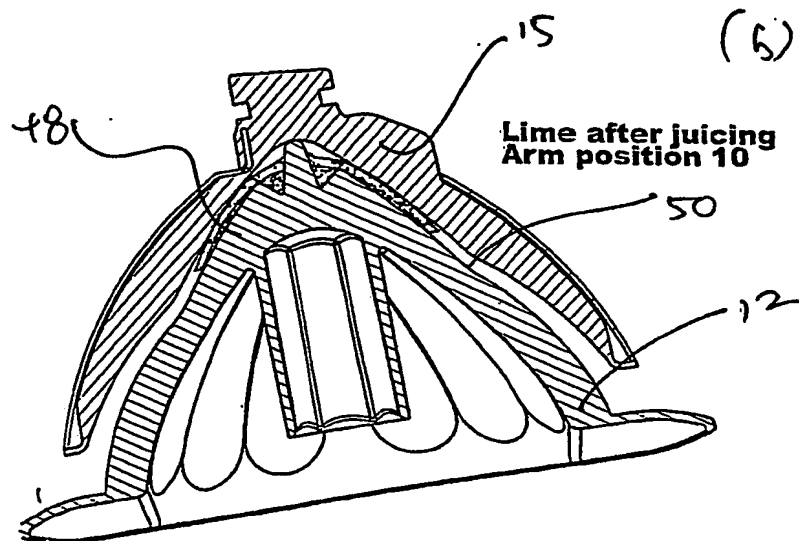




Lime loaded onto reamer spike  
Arm position 8

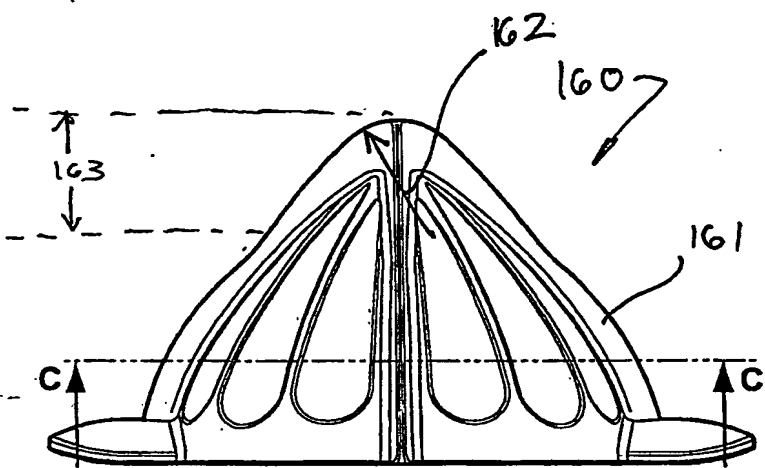
(a)

Fig. 15



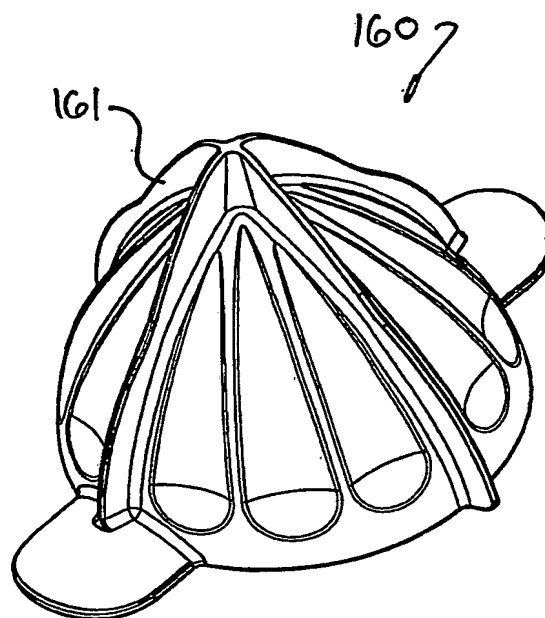
Lime after juicing  
Arm position 10

(b)



**Reamer Elevation View**

(a)



**Reamer Perspective View**

(b)

Fig. 16

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